

PTO 09-2951

CC=JP
DATE=19891011
KIND=KOKAI
PN=01254494

AIRCRAFT CAPABLE OF IN-FLIGHT CARGO LOADING
[TOUSAIBUTU WO
KUUCHUU KYOUKYUU SURU KOUKUUKI]

TAKEO INATOMI

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. FEBRUARY 2009
TRANSLATED BY: SCHREIBER TRANSLATION, INC.

PUBLICATION COUNTRY	(10):	JP
DOCUMENT NUMBER	(11):	01254494
DOCUMENT KIND	(12):	KOKAI
PUBLICATION DATE	(43):	19891011
APPLICATION NUMBER	(21):	63-81215
APPLICATION DATE	(22):	63(1988) 04 04
INTERNATIONAL CLASSIFICATION	(51):	B 64 D 5/00 B 64 C 39/02
PRIORITY COUNTRY	(33):	
PRIORITY NUMBER	(31):	
PRIORITY DATE	(32):	
INVENTOR(S)	(72):	Takeo Inatomi
APPLICANT(S)	(71):	Mitsubishi Heavy Industries, Ltd.
DESIGNATED CONTRACTING STATES	(81):	
TITLE	(54):	Aircraft Capable of In-Flight Cargo Loading
FOREIGN TITLE	[54A]:	Tousaibutu wo Kuuchuu Kyoukyuu suru Koukuuki

Specification

1. Title of Invention

Aircraft Capable of In-Flight Cargo Loading

2. Scope of Claims

An aircraft capable of in-flight cargo loading characterized by a securing device to secure an aircraft that receives items and a loading device to load items onto the receiving aircraft that has been secured.

3. Detailed Description of the Invention

[Industrial Field of Application]

The present invention pertains to an aircraft supplying items to other aircrafts.

[Prior Art]

Conventional aircrafts are designed to load external items on the ground.

[Problem to Be Solved by the Invention]

Since conventional aircrafts can only load external items on the ground, they need to return to the ground after releasing the loaded items.

As Figure 4 shows, an aircraft 2, after releasing an item 5, needs to return to a ground base 10, where it is loaded again for another take-off.

The present invention intends to solve the problems above, offering a device to allow a mother aircraft to

supply items to other aircrafts.

[Means of Solving the Problem]

To achieve the objective above, an aircraft according to the present invention is equipped with a securing device to secure an aircraft that receives items and a loading device to load items onto the receiving aircraft that has been secured.

[Operation]

According to the present invention, when a receiving aircraft comes close to a flying mother aircraft incorporating the securing and loading devices above, the securing device will secure the receiving aircraft to the mother aircraft. The loading device of the mother aircraft will then load items onto the receiving aircraft that has

/2

been secured while they are flying. When the loading process is completed, the securing device will be detached, and the loaded aircraft will take off from the mother aircraft.

[Embodiment]

An embodiment of the present invention is described with reference to Figures 1 and 2.

Item 1 is an aircraft that supplies items (mother aircraft hereafter), and item 2 is an aircraft that

receives external items (receiving aircraft hereafter). At the bottom of the body of the mother aircraft 1 are a securing device 3, composed of a contact 3a designed to contact the receiving aircraft 2, which is a two pronged device with symmetrical legs each oriented forward and backward, a support rod 3b mounted to the bottom of the body of the mother aircraft 1 to be deployed so that the contact 3a can move vertically, and a connector 3c at the tip of the support rod 3b, and a foldable arm 4 to hold an external item 5 attached to the tip of the securing device.

At the top of the body of the receiving aircraft 2 is a connector 6 to be engaged with the connector 3c of the mother aircraft 1.

In this embodiment, as Figure 2 shows, the external item 5 will be loaded from the mother aircraft 1 to the receiving aircraft 2 in the following manner.

- (1) The receiving aircraft 2 will move closer to the mother aircraft 1 until it positions itself under the body of the mother aircraft and both aircrafts are flying in parallel (Figure 2 (A)).
- (2) The connectors 3c and 6 will be engaged while both aircrafts 1, 2 are flying in parallel.
- (3) The contact 3a will lower the support rod 3b to contact the front edge and the rear edge of the main

wing of the receiving aircraft 2, and the securing device 3 will secure the contact so that the receiving aircraft 2 will be firmly attached to the mother aircraft 1 (Figure 2 (B)).

- (4) The item 5 will be loaded onto a predetermined position of the receiving aircraft 2 such as engine mounting pylon by controlling the arm 4 installed in the mother aircraft 1 (Figure 2 (C)).

In this embodiment, as discussed above, the receiving aircraft 2 will receive the item 5 from the mother aircraft 1 in flight; therefore, as Figure 3 shows, the receiving aircraft 2, after releasing the item 5, will fly back to the mother aircraft waiting near the location where the item was released, receive another item from the mother aircraft 1 in flight, and release this item again, enhancing the release effectiveness and fuel efficiency of the receiving aircraft 2.

[Effect of the Invention]

The present invention, as discussed above, allows an aircraft that serves as a mother aircraft to supply items to another aircraft in flight, enhancing the efficiency of the release operation and saving the fuel used by the receiving aircraft.

The receiving aircraft is secured onto the mother

aircraft during the loading operation, insuring that items are loaded onto the receiving aircraft.

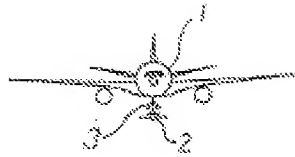
4. Brief Description of Drawings

Figure 1 shows an embodiment of the present invention; in the figure (A) and (B) are front and side views respectively. Figure 2 (A), (B), and (C) illustrate the process of securing a receiving aircraft and loading of items onto the receiving aircraft in the above embodiment; Figure 3 illustrates the flight of the receiving aircraft with reference to cargo release and loading in the above embodiment; and Figure 4 illustrates the flight of a conventional aircraft with reference to cargo release and loading.

- 1, 2 aircrafts
- 3 Securing device
- 3a Contact of securing device
- 3b Support rod of securing device
- 4 Arm
- 5 Cargo item

/3

Figure 1 (A)



(B)

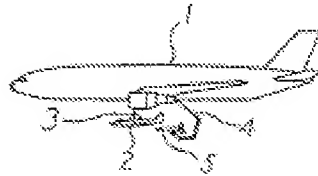
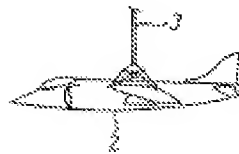


Figure 2 (A)



(B)



(C)

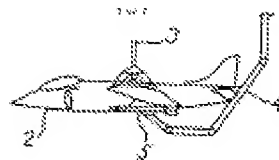


Figure 3

5 Cargo release

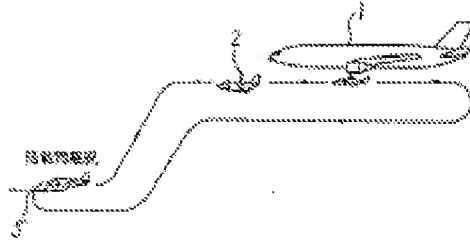


Figure 4

5 Cargo release

Landing

Takeoff

